Section 1013 - UDOT Laboratory Qualification

1013.1 Introduction

Laboratories performing work for UDOT must be qualified. To meet the requirements for a qualified UDOT laboratory, the following seven criteria must be met.

- participate in independent assurance (IA) activities through proficiency samples and specified test procedures
- submit proficiency test results and verify responses to failed tests
- maintain a quality systems manual
- maintain current UDOT Technician Training (TTQP) certification of personnel
- conduct regular equipment calibrations and receive annual equipment inspections
- evaluate equipment used in quality acceptance through IA split samples
- maintain test results and records

The Quality Assurance Section monitors each laboratory's compliance. UDOT laboratory qualifications will be evaluated every twelve months for renewal. A listing of approved independent testing laboratories and their specific areas of testing eligibility are found on the UDOT web page at http://www.dot.state.ut.us/index.php/m=c/tid=418.

Accreditation through UDOT's Materials Quality Assurance Section, utilizing AASHTO Accreditation (AAP), must be obtained for AASHTO test methods which are modified or referenced in the *Materials Manual of Instruction, Part 8*. The manual must be readily available to all laboratory personnel. The latest edition of UDOT's *Materials Manual of Instruction - Part 8* is on the UDOT web page at http://www.dot.state.ut.us/index.php/m=c/tid=644.

1013.1.2 When a consultant laboratory hires a subcontractor, UDOT will be notified and involved in the approval action. The subcontractor will meet the same standards and requirements as the consultant laboratory. Accredited consultant labs employing satellite labs on UDOT projects will provide proof that the satellite labs are qualified. The accredited laboratory will have documented procedures, acceptable to UDOT, for qualifying satellite laboratories. UDOT project field labs are classified as satellite labs and fall under the accreditation umbrella of the region laboratory. Consultant field labs are classified as satellite labs and fall under the accreditation umbrella of their main lab.

1013.2 Test procedures - proficiency samples - required test list

Federal regulations require laboratories providing testing services for acceptance, performing IA activities, or dispute resolution to be qualified by an approved accreditation program. Similarly, UDOT requires accreditation through the AASHTO Laboratory Accreditation Program for UDOT Central, UDOT Region, consultant, and dispute resolution laboratories.

Any laboratory seeking UDOT Qualification must participate in the applicable AASHTO Materials Reference Laboratory (AMRL,) Proficiency Sample Program.

The AMRL/CCRL program provides each of the proficiency samples listed below distributed at twelve month* intervals:

- Soils
- Fine Aggregate
- Coarse Aggregate

- Hot Mix Asphalt
- Concrete *(six month intervals)
- Performance Graded Asphalt Binder
- Emulsified Asphalt
- Portland Cement & Pozzolan

1013.2.1 In the UDOT Laboratory Qualification Program (LQP), labs are qualified in any of four areas including aggregate, soils, PCC, and HMA/Superpave. To establish a **minimum** level of competency for qualified laboratories, participation in the following AMRL and CCRL proficiency sample tests is **required**:

:Required tests for UDOT qualification in Aggregate

Test	*Description*
T 27	Sieve Analysis of Fine and Coarse Aggregate
T 11	Material Finer than No. 200 Sieve in Mineral Aggregate by Washing

Required tests for UDOT qualification in HMA/Superpave:

Test	*Description*
T 308	Asphalt Binder Content of HMA by the Ignition Method
T 209	Maximum Specific Gravity and Density of Bituminous Paving Mixtures
T 166	Bulk Specific Gravity of Compacted Bituminous Mixtures Using SSD Specimens
T 30	Mechanical Analysis of Extracted Aggregate
T 312	Determining Density of HMA Specimens by Means of the Superpave Gyratory Compactor

Required tests for UDOT qualification in Soils:

Test	*Description*
T 99	Moisture-Density Relations of Soils Using a 5.5 lb Rammer and 12 Inch Drop
T 89	Determining the Liquid Limit of Soils
T 90	Determining the Plastic Limit and Plasticity Index of Soils

Required tests for UDOT qualification in PCC: (AMRL utilizes CCRL for the following tests in PCC)

Test	*Description*
T 119	Slump of Hydraulic Cement Concrete
T 152	Air Content of Freshly Mixed Concrete by the Pressure Method
T 23	Method of Making and Curing Concrete Test Specimens in the Field

Test	*Description*
T 22	Compressive Strength of Cylindrical Concrete Specimens

Participation in the required proficiency sample tests will be verified through the AMRL website. **Non-participation in the required tests may result in suspension from the qualified list until proof of participation from AMRL is provided.**

1013.2.2 Submit proficiency test results and verify responses to failed tests

Consultant and region laboratories will make available to UDOT all AASHTO correspondence including proficiency sample results, inspection report forms, and non-accreditation proficiency sample results. **Failure to promptly submit correspondence may result in suspension until the information is provided.**

A lab receiving poor results on proficiency samples will be required to submit to UDOT a copy of their response to AMRL explaining the reason for the results.

1013.3 Maintain a Quality Systems Manual

A qualified lab will maintain a Quality Systems Manual that conforms to the requirements based on quality system criteria established in AASHTO Standard Practice R18 Section 6

1013.3.1 The Manual will include:

Organization and Policies
- preparation date
- legal name and address of the lab and main office or company if different
- names, affiliations and positions of principal officers, owners, directors
- an organization chart showing relevant internal components....(Managing Engineers, Lab Supervisors, Technicians)
- a Quality System Policy Statement and objectives

Staff
- position descriptions for each technical operational position on the organization chart, Identifying the position, required duties, required skills, education, and experience. A reference to where the position descriptions are found is acceptable.
- bio-sketches for supervisory technical staff or a reference to where bio-sketches can be found.
- a document describing methods of how staff competency is measured...including the frequency of evaluations for each technician, what position or employee is responsible to conduct the evaluations and maintain the records, and a reference to where the records can be found.
- a form for recording training and competency including a location for the trainee name, the name of the evaluator, the test method evaluated and the dates and results.

Equipment
- an inventory of major sampling, testing, calibration and verification equipment. A reference to where the inventory is located is acceptable. The inventory shall include the name, date in service, condition when received, manufacturer, model and serial number of the equipment (an identifying number assigned by the lab is acceptable). Major equipment includes shakers, physical or chemical testing machines, balances, baths, ovens, microscopes and computing equipment dedicated to testing. Major equipment does not include expendable items such as glassware, sieves, molds and viscometers.

- a list for testing equipment which requires calibration including the interval of calibration and a reference to the calibration procedure used (either the standard or in-house procedure), and the location of the calibration records.
- a document that describes the method calibrations are tracked and verified
  - a list of all in-house calibration procedures
  - documents that establish the traceability of in-house equipment calibration standards

Test Records and Reports
- a document that describes methods used to produce test records and prepare, check and amend test reports. Should identify individuals responsible for maintaining test records and reports.
- contain typical test report forms

Sample Management
- a document describing procedures for sample identification, storage and retention and disposal of samples.

Diagnostic and Corrective Action
- a document describing participation in proficiency sample and on-site inspection programs, methods used to identify poor results and procedures to resolve deficiencies when they occur.

Internal Quality Systems Review
- a document describing the scope of internal quality system reviews.

Subcontracting
- a document describing the lab's policy and procedures for subcontracting.

(Form A1 for inspecting and evaluating the Quality Systems Manual is included in the appendix.)

1013.3.2 Satellite labs are required to have a quality systems manual readily available to all laboratory personnel

1013.4 Maintain Current Certification of Personnel:

Technicians working on UDOT projects must be qualified by the UDOT Technician Transportation Qualification Program (TTQP). Specialized courses have been developed by the Quality Assurance Section and WAQTC for UDOT. These courses cover the sampling and testing of soils, aggregates, asphalt binder, asphalt mix and Portland cement concrete. The UDOT *"Registration, Policies, and Information Handbook"* (http://www.dot.state.ut.us/download.php/tid=416/RPIH.pdf) details information on training requirements, course outlines and required prerequisites. *ACI Concrete Field Testing Grade One Qualification* and *ACI Concrete Strength Testing Technician* may be utilized as the basis for CTT and CSTT qualifications respectively. A TTQP Qualification will be issued upon receipt of a copy of ACI qualifications and a completed "Rights and Responsibilities" form. This qualification is subject to the requirements outlined in 1014.2.3. Qualified Technicians must participate in Independent Assurance activities as outlined in Manual of Instruction section 1012.

Refer to the UDOT Manual of Instruction - Part 8, Section 1014 (http://www.dot.state.ut.us/download.php/tid=644/7_sec5%201014.pdf) for levels of qualification and certification requirements.

Verification of laboratory personnel certification will take place during the annual laboratory inspection. The Technician Qualification Database includes a report for laboratory inspections to verify that all laboratory personnel are certified.

1013.5 Equipment Calibration/Inspection

The laboratory equipment inspection consists of checking conformance of all apparatus and equipment required for use on UDOT projects. This inspection and certification program is not a calibration service for non-UDOT laboratories. Equipment found unacceptable must be repaired, calibrated, or removed from service at the expense of the owner's laboratory. Laboratory facilities will be inspected for compliance with applicable standards, such as proper temperature and humidity control. Laboratory equipment qualifications will be conducted by the QA Equipment Certification team a minimum of once every 12 months. Request an inspection online at the following link: http://www.udot.utah.gov/index.php/m=c/tid=418. . Equipment utilized in quality acceptance activities will be evaluated in the IA split sample and proficiency sample activities a minimum of once a year. **It is the responsibility of the qualified lab to seek Independent Assurance.**

1013.5.1 Equipment in UDOT Labs - The QA Equipment Certification Team will be responsible for the repair, calibration and certification of scales, compression testing equipment, and destructive testing equipment.

1013.5.2 Equipment in Private Labs -The QA Equipment Certification Team will be responsible for the verification of equipment calibration and certification. Any equipment found unacceptable must be immediately removed from service and be repaired, replaced or calibrated within ten working days of inspection at the expense of the owner's laboratory. **Verification of equipment calibration and certification will take place within 30 days of the annual lab inspection.**

1013.5.3 Satellite or field laboratory equipment will be calibrated and certified every 12 months or after every move. The Resident Engineer will be responsible for verifying that the calibration and certification has been performed before the lab is used on UDOT projects.

1013.5.4 Annual multiple block calibrations will be required for all nuclear gauges used on all UDOT projects.

1013.5.5 Annual air meter calibrations are required by calibration method AASHTO T 152.

1013.6 Maintain Test results and records

All laboratories will maintain test records for 3 years as specified by AASHTO R 18.

Laboratories shall maintain test records, which contain sufficient information to permit verification of any test reports. Records pertaining to testing shall include original observations, calculations, derived data and an identification of personnel involved in sampling and testing.

Maintenance of test records will be verified during the annual laboratory inspections.

1013.7 Removal of Labs from qualified List

The main intent of the Lab Qualification Program is to certify that qualified laboratories are operating effectively at an acceptable level. Minor deficiencies or omissions may exist in fulfilling the requirements of

the LQP. If the inspector discovers these deficiencies, an appropriate time period for corrective action may be specified.

Failure to comply with the requirements of the LQP may result in removal from the qualified list and will result in a lab no longer being eligible to work on UDOT projects. Major deficiencies that may result in suspension include the following:

- Use of non-qualified personnel for sampling and testing or failure of personnel to follow prescribed testing and sampling methods
- Failure to comply with any of the seven requirements for a qualified laboratory
- Falsifying records of any kind
- Failure to correct deficiencies noted previously
- Failure to participate in Independent Assurance activities

If the Quality Assurance Engineer determines that a laboratory will be suspended from the Qualified List, the laboratory will be notified in writing of the decision, specifying the reason for and length of suspension. At the end of the specified time period, a lab may petition for re-instatement by submitting in writing that all deficiencies that caused the removal have been corrected. The Quality Assurance Engineer will determine through an unannounced inspection that corrective action has been taken and immediately re-instate the lab if the deficiencies have been corrected.

If a laboratory contests a decision of disqualification within 30 days of suspension, a hearing will be held before the Quality Assurance Engineer and a panel of peers (representatives of other qualified labs) selected and assembled by the QA Engineer. The disqualified lab may recommend members of the peer panel, however, selection of the members is at the discretion of the QA Engineer. The disqualified lab will be allowed to present evidence supporting non-disqualification. If the panel determines the evidence supports non-disqualification, the lab will be immediately re-instated.

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